

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Kie Y. Ahn et al.

Title: LANTHANIDE OXIDE / HAFNIUM OXIDE DIELECTRICS

Docket No.: 1303.107US1

Filed: June 24, 2003

Examiner: Unknown

Serial No.: 10/602315

Due Date: N/A

Group Art Unit: 2812

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450



We are transmitting herewith the following attached items (as indicated with an "X"):

X A return postcard.

X An Information Disclosure Statement (2 pgs.), Form 1449 (2 pgs.), and copies of 19 cited documents.

If not provided for in a separate paper filed herewith, Please consider this a PETITION FOR EXTENSION OF TIME for sufficient number of months to enter these papers and please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
Customer Number 21186

By: David R. Cochran
Atty: David R. Cochran
Reg. No. 46,632

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Judy Mosher
Name

Judy Mosher
Signature

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
(GENERAL)

S/N 10/602315



PATENT

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INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq.*, the enclosed materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicants respectfully request that this Information Disclosure Statement be entered and the documents listed on the attached Form 1449 be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicants request that a copy of the 1449 form, initialed as being considered by the Examiner, be returned to the Applicants with the next official communication.

Pursuant to 37 C.F.R. §1.97(b), it is believed that no fee or statement is required with the Information Disclosure Statement. However, if an Office Action on the merits has been mailed, the Commissioner is hereby authorized to charge the required fees to Deposit Account No. 19-0743 in order to have this Information Disclosure Statement considered.

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The Examiner is invited to contact the Applicants' Representative at the below-listed telephone number if there are any questions regarding this communication.

Respectfully submitted,

KIE Y. AHN ET AL.

By their Representatives,


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Date 1 MARCH 2004

By


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Judy Mosher
Name

Judy Mosher
Signature

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

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Sheet 1 of 2

Complete if Known

Application Number	10/602315
Filing Date	June 24, 2003
First Named Inventor	Ahn, Kie
Group Art Unit	2812
Examiner Name	Unknown

Attorney Docket No: 1303.107US1

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
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OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		BENDORAITIS, J G., et al., "Optical energy gaps in the monoclinic oxides of hafnium and zirconium and their solid solutions", <u>Journal of Physical Chemistry</u> , 69(10), (1965),3666-3667	
		GUILLAUMOT, B, et al., "75 nm damascene metal gate and high-k integration for advanced CMOS devices", <u>Technical Digest of International Electron Devices Meeting, 2002</u> , (2002), 355-358	
		GUTOWSKI, M J., "Thermodynamic stability of high-K dielectric metal oxides ZrO/sub 2/ and HfO/sub 2/ in contact with Si and SiO/sub 2/", <u>Applied Physics Letters</u> , 80(11), (March 18, 2002),1897-1899	
		JEON, SANGHUN, et al., "Excellent electrical characteristics of lanthanide (Pr, Nd, Sm, Gd, and Dy) oxide and lanthanide-doped oxide for MOS gate dielectric applications", <u>Electron Devices Meeting, 2001. IEDM Technical Digest. International</u> , (2001),471-474	
		JUNG, H S., et al., "Improved current performance of CMOSFETs with nitrogen incorporated HfO/sub 2/-Al/sub 2/O/sub 3/ laminate gate dielectric", <u>Technical Digest of International Electron Devices Meeting 2002</u> , (2002),853-856	
		KANG, L, et al., "MOSFET devices with polysilicon on single-layer HfO/sub 2/ high-K dielectrics", <u>International Electron Devices Meeting 2000. Technical Digest. IEDM</u> , (2000),35-8	
		KIM, Y W., et al., "50nm gate length logic technology with 9-layer Cu interconnects for 90nm node SoC applications", <u>Technical Digest of International Electron Devices Meeting 2002</u> , (2002),69-72	
		KUKLI, K, et al., "Comparison of hafnium oxide films grown by atomic layer deposition from iodide and chloride precursors", <u>Thin Solid Films</u> , 416, (2002),72-79	
		KUKLI, KAUPON, et al., "Influence of thickness and growth temperature on the properties of zirconium oxide films growth by atomic layer deposition on silicon", <u>Thin Solid Films</u> , 410(1-2), (2002),53-60	
		KUKLI, K J., et al., "Properties of hafnium oxide films grown by atomic layer deposition from hafnium tetraiodide and oxygen", <u>Journal of Applied Physics</u> , 92(10), (November 15, 2002),5698-5703	
		LEE, BYOUNG H., et al., "Characteristics of TaN gate MOSFET with ultrathin hafnium oxide (8 A-12 A)", <u>Electron Devices Meeting, 2000. IEDM Technical Digest. International</u> , (2000),39-42	
		LEE, BYOUNG H., et al., <u>Technical Digest of International Electron Devices Meetings 2002</u> , 221-224.	

EXAMINER

DATE CONSIDERED

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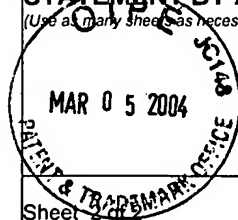
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Sheet 2 of 2

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First Named Inventor Ahn, Kie

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		LEE, S J., et al., "High quality ultra thin CVD HfO ₂ gate stack with poly-Si gate electrode", <u>Electron Devices Meeting, 2000. IEDM Technical Digest. International, (2000),31-34</u>	
		OH, C B., et al., "Manufacturable embedded CMOS 6T-SRAM technology with high-k gate dielectric device for system-on-chip applications", <u>Technical Digest of International Electron Devices Meeting 2002, (2002),423-426</u>	
		PARK, JAEHOO, et al., "Chemical vapor deposition of HfO ₂ /sub 2/ thin films using a novel carbon-free precursor: characterization of the interface with the silicon substrate", <u>Journal of the Electrochemical Society, 149(1), (2002),G89-G94</u>	
		POVESHCHENKO, V P., et al., "Investigation of the phase composition of films of zirconium, hafnium and yttrium oxides", <u>Soviet Journal of Optical Technology, 51(5), (1984),277-279</u>	
		ROBERTSON, J., "Band offsets of wide-band-gap oxides and implications for future electronic devices", <u>Journal of Vacuum Science & Technology B (Microelectronics and Nanometer Structures), 18(3), (May-June 2000),1785-1791</u>	
		TAVEL, B, et al., "High performance 40 nm nMOSFETs with HfO ₂ /sub 2/ gate dielectric and polysilicon damascene gate", <u>Technical Digest of International Electron Devices Meetings 2002, (2002),429-432</u>	
		ZHANG, H, et al., "High permittivity thin film nanolaminates", <u>Journal of Applied Physics, 87(4), (February 2000),1921-1924</u>	

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